

EPS NO. 1020

SUBJECT: ANSI/ASHRAE/IES STANDARD 90.1-2010 INSULATION REQUIREMENTS

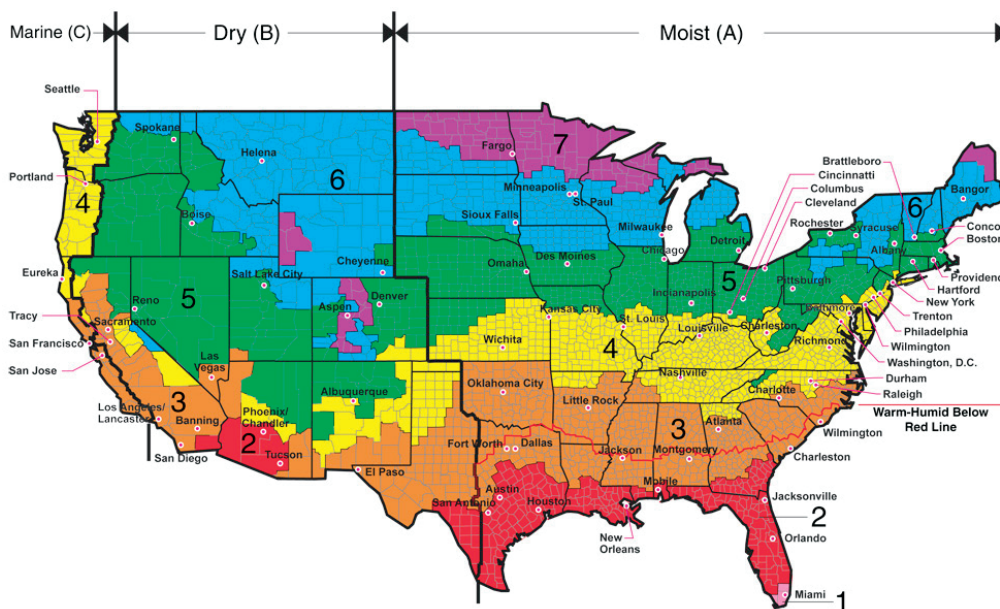
DATE: APRIL 2012 (REVISED JANUARY 2019)

R-Shield® insulation is a versatile insulation material which is suitable for installation in all areas of buildings. R-Shield insulation is available in a wide range of types and sizes to ensure that building owners are able to meet the most advanced energy code requirements, such as those published by the American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc.(ASHRAE). This bulletin provides a summary of the prescriptive insulation requirements of the 2010 edition of ASHRAE Standard 90.1, “Energy Standard for Buildings Except Low-Rise Residential Building”. Please refer to ASHRAE Standard 90.1 for detailed information.

ASHRAE Standard 90.1 is applied to commercial buildings and multistory residential buildings and is often adopted as a code requirement at the State level. State adoption of ASHRAE 90.1 may also be to the prior versions of ASHRAE90.1 issued in 2001, 2004, and 2007.

The tables included with this bulletin provide the minimum prescriptive insulation requirements of ASHRAE90.1-2010. Alternative paths for conformance through detailed analysis are also available within the standard. Insulation requirements vary according to Climate Zone.

Climate Zones



All of Alaska in Zone 7 except for the following Boroughs in Zone 8: Bethel, Dellingham, Fairbanks, N. Star, Nome North Slope, Northwest Arctic, Southeast Fairbanks, Wade Hampton, and Yukon-Koyukuk

Zone 1 includes: Hawaii, Guam, Puerto Rico, and the Virgin Islands

Walls, Above Grade

ASHRAE Standard 90.1 provides prescriptive insulation requirements for above grade walls of heated buildings constructed with wood framing, steel framing, metal buildings, and mass (concrete, CMU, or stone) systems. The first number in the table below is the requirement for cavity insulation and the second number is for continuous insulation (ci). Continuous insulation minimizes heat loss since the insulation is installed continuously across the wall without thermal bridges other than fasteners and service openings.

ASHRAE 90.1-2010 PRESCRIPTIVE R-VALUE								
Walls, above grade								
	Wood-Framed		Steel-Framed		Metal-Framed		Mass	
Zone	Nonresidential	Residential	Nonresidential	Residential	Nonresidential	Residential	Nonresidential	Residential
1	13	13	13	13	16	16	NR	5.7ci
2	13	13	13	13+7.5ci	16	16	5.7ci	7.6ci
3	13	13	13+3.8ci	13+7.5ci	19	19	7.6ci	9.5ci
4	13	13+3.8 ci	13+7.5ci	13+7.5ci	19	19	9.5ci	11.4ci
5	13+3.8ci	13+7.5ci	13+7.5ci	13+7.5ci	13+5.6ci	13+5.6ci	11.4ci	13.3ci
6	13+7.5ci	13+7.5ci	13+7.5ci	13+7.5ci	13+5.6ci	13+5.6ci	13.3ci	15.2ci
7	13+7.5ci	13+7.5ci	13+7.5ci	13+15.6ci	13+5.6ci	13+5.6ci	15.2ci	15.2ci
8	13+15.6ci	13+15.6ci	13+15.6ci	13+18.8ci	19+5.6ci	19+5.6ci	15.2ci	25.0ci

ci = continuous insulation

Wall, Below Grade

ASHRAE Standard 90.1 provides prescriptive insulation requirements for below grade walls of heated buildings. Continuous insulation minimizes heat loss since the insulation is installed continuously across the wall without thermal bridges other than fasteners and service openings.

ASHRAE 90.1-2010 PRESCRIPTIVE R-VALUE		
Walls, below grade		
Zone	Nonresidential	Residential
1	0	0
2	0	0
3	0	0
4	0	7.5ci
5	7.5ci	7.5ci
6	7.5ci	7.5ci
7	7.5ci	10.0ci
8	7.5ci	12.5ci

ci = continuous insulation

Floor and Slabs

ASHRAE Standard 90.1 provides the prescriptive insulation requirements for mass floors and slab on grade floors of heated and unheated building.

ASHRAE 90.1-2010 PRESCRIPTIVE R-VALUE						
Floors						
	Mass		Slab-On-Grade Heated		Slab-On-Grade UnHeated	
Zone	Nonresidential	Residential	Nonresidential	Residential	Nonresidential	Residential
1	NR	NR	R-7.5 for 12 in.	R-7.5 for 12 in.	NR	NR
2	6.3ci	8.3ci	R-7.5 for 12 in.	R-7.5 for 12 in.	NR	NR
3	6.3ci	8.3ci	R-10 for 24 in.	R-10 for 24 in.	NR	NR
4	8.3ci	10.4ci	R-15 for 24 in.	R-15 for 24 in.	NR	R-10 for 24 in.
5	10.4ci	12.5ci	R-15 for 24 in.	R-15 for 24 in.	NR	R-10 for 24 in.
6	12.5ci	14.6ci	R-15 for 24 in.	R-20 for 48 in.	R-10 for 24 in.	R-15 for 24 in.
7	12.5ci	16.7ci	R-20 for 24 in.	R-20 for 48 in.	R-15 for 24 in.	R-15 for 24 in.
8	14.6ci	16.7ci	R-20 for 48 in.	R-20 for 48 in.	R-15 for 24 in.	R-20 for 24 in.

ci = continuous insulation

Roof Insulation

ASHRAE Standard 90.1 provides the prescriptive insulation requirements for continuous roof insulation above roof decks.

ASHRAE 90.1-2010 PRESCRIPTIVE R-VALUE		
Roof		
Above Deck		
Zone	Nonresidential	Residential
1	15ci	20ci
2	20ci	20ci
3	20ci	20ci
4	20ci	20ci
5	20ci	20ci
6	20ci	20ci
7	20ci	20ci
8	20ci	20ci

ci = continuous insulation